PHYSICS NMDCAT

TOPIC WISE TEST (UNIT–2)

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TOPICS:

✓ **Work and Energy**

Q. 1 If a body of 1kg raised through 1m height work done will be
A. 5. J
B. 1J
C. 0.1J
D. 10J

Q. 2 KWh is a unit of
A. Power
B. impulse
C. Energy
D. inertia

Q. 3 Work done is negative if θ is
A. 0
B. 60°
C. 30°
D. 180°

Q. 4 1MWh is equal to _____ joule.
A. 3.6×10^{10}
B. 3.6×10^6
C. 3.6×10^9
D. 3.6

Q. 5 The energy possessed by a body due to its motion is called
A. Elastic P.E
B. Gravitation P.E
C. K.E
D. Electric energy

Q. 6 A body of 5 kg has P.E of 98J its height is
A. 5m
B. 10
C. 7m
D. 2m

Q. 7 A body of 5N falls through 0.25m height its K.E will be
A. 1.25J
B. 125J
C. 12.5J
D. 0.125J

Q. 8 When the force retards the motion of body the work done is
A. 0
B. – Ve
C. +Ve
D. Depend

Q. 9 A force of $3\hat{i} + 4\hat{j}$ N displaces the body by $2\hat{i} + 3\hat{j}$ m work done by force is
A. 18J
B. 12J
C. –18J
D. 20J

Q. 10 Two bodies of 1kg and 2 kg have equal momentum the ratio of their KE is
A. 1:1
B. 2:1
C. 1:2
D. 3:1

Q. 11 An electric motor creates tension of 4500N in a cable and reels at 2ms⁻¹ the power of motor is
A. 15 kW
B. 9000 kW
C. 9kW
D. 205 kW

Q. 12 A particle moves with $\vec{V} = 5\hat{i} - 3\hat{j} + 6\hat{k}$ ms⁻¹ under $\vec{F} = 10\hat{i} + 10\hat{j} + 20\hat{k}$ N. the power applied
A. 200 Js⁻¹
B. 170 Js⁻¹
C. 40 Js⁻¹
D. 140 Js⁻¹

Q. 13 A moving body need not to have
A. K.E
B. Momentum
C. P. E
D. Velocity

Q. 14 The engine of an inter-city train travelling at 50 ms⁻¹ delivers powers of 2 MW what is force exerted by engine?
A. 4×10^4 N
B. 4×10^7 N
C. 1×10^5 N
D. 1×10^8 N

Q. 15 Rate of doing work is known as
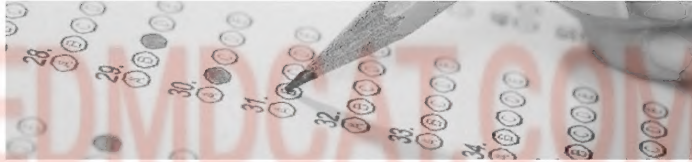
A. 1mpulse   B. power
C. Momentum   D. torque

Q. 16 Energy time graph is shown in Fig power deliver
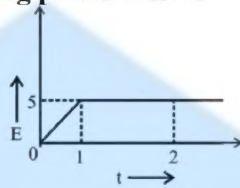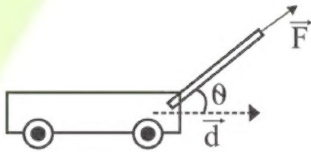
A. 2.5 W
B. 0.2 W
C. 5 W
D. 0.5 W

Q. 17 If power of 1 kW is maintained for 1 sec than work done is
A. 10^5 J
B. 10^{-6} J
C. 10^3 J
D. 3.6 MJ

Q. 18 What is the mathematical expression for the K.E of a body of mass m moving with speed v

A. $2mv^2$
B. $\frac{1}{2}\frac{v^2}{m}$

C. $\frac{1}{2}\frac{m}{v^2}$
D. $\frac{1}{2}m\left(\vec{v}.\vec{v}\right)$

Q. 19 The P.E of mass m at height 50m above the ground is 100J. At what height from the ground its P.E becomes 200 J
A. 20m
B. 17.5
C. 15m
D. 100m

Q. 20 A 4kg body is thrown vertically upward from the ground with a velocity of 5m/s. Its K.E just before hitting the ground is
A. 25J
B. 50J
C. 75J
D. 100J

Q. 21 A body falls freely under gravity. Its velocity is v when it has lost a P.E of U. The mass of body is
A. $\frac{2U}{v^2}$
B. $\frac{U}{v^2}$
C. $\frac{U}{2v^2}$
D. $v \times U$

Q. 22 A uniform force of 4N acts on a body of mass 40kg for a distance of 2m. the K.E acquired by the body is
A. $4 \times 2 \times 2$ J
B. $4 \times 2 \times 2 \times 4$ erg
C. 4×2 J
D. $4 \times 4 \times 2$ erg

Q. 23 If two electrons are forced to come closer to each other, then P.E of the electrons
A. Becomes zero
B. Increases
C. Decrease
D. Becomes infinite

Q. 24 The amount of work done by a labourer who carries "n" bricks, each of mass 'm', to the roof of a house whose height is "h"
A. nmgh
B. $\frac{mgh}{h}$
C. Zero
D. $\frac{ghn}{m}$

Q. 25 Which one of the following is watt
A. Kg ms^{-2}
B. Nms^{-2}
C. Kgms^{-3}
D. Nm s^{-1}

Q. 26 The work done by a force (F) inclined at an angle θ with the displacement D.is
A. $\frac{\vec{F}}{\vec{d}}$
B. $\frac{\vec{d}}{\vec{F}}$
C. $\vec{F} \times \vec{d}$
D. $\vec{F}.\vec{d}$

Q. 27 A man pushes a wall but fails to displace it. He does
A. Negative work
B. Positive and maximum work
C. Positive but small work
D. No work at all

Q. 28 A body is falling freely from A to B, the total energy of body at point C is

A. Equal to the total energy at point A   B. Less than the total energy at point A
C. Greater than the total energy at point A   D. One fourth of the total energy at point A

Q. 29 A mechanical wrist watch has

A. No energy stored in it   B. Electrical energy stored in it
C. Heat energy stored in it   D. Elastic potential energy

Q. 30 Work done by gravity when P.E of body is increased is

A. Positive   B. Negative
C. Zero   D. Both positive and negative

Q. 31 Which one is biggest unit of energy?

A. Joule   B. KWh
C. Calories   D. erg

Q. 32 A grocery trolley is shown in the figure. For which value of "θ" the work done becomes half of its maximum?

A. 45°   B. 30°
C. 60°   D. 90°

Q. 33 Two persons take different reference states for zero potential energy. The change in potential energy for two persons at same height

A. Are same   B. Depend strictly on the choice of zero potential
C. Are different   D. Become indeterminate

Q. 34 Kinetic energy of a body moving with speed of 10 ms^{-1} is 30J. If its speed becomes 30 m/s its K.E will be

A. 10 J   B. 90 J
C. 180 J   D. 270 J

Q. 35 The time taken by an engine of power 10 kW to lift a mass of 200 kg to the height of 40 m is

A. 2 s   B. 4 s
C. 8 s   D. 16 s

Q. 36 Work done by a variable force making angles at different points with displacement in moving the particle from one point to another is equal to the area under the curve of

A. F Sin θ versus d   B. F Cos θ versus d Cos θ
C. F Cos θ versus d   D. F versus d Cos θ

Q. 37 The average power required to lift a 100kg mass through a height of 50 metres in approximately 50 seconds would be (in J/s)

A. 50   B. 5000
C. 100   D. 980

Q. 38 If linear momentum of body is increased by 1.5%, its kinetic energy increases by.......%

A. 0%   B. 10%
C. 3%   D. 5%

Q. 39 A girl is carrying a bucket of water on her head from water reservoir situated near her house, the work done by her is

A. Maximum   B. Zero
C. Minimum   D. None

Q. 40 For constant force, the shape of the graph between power and velocity will be

A. A circle   B. A parabola
C. A hyperbola   D. A straight line

Q. 41 A body is subjected to a constant force $\vec{F} = -\hat{i} + 2\hat{j} + 3\hat{k}$. What is the work done by this force in moving the body through a distance of 4m along z-axis and 3m along y-axis?

A. 6 J
B. 12 J
C. 18 J
D. 24 J

Q. 42 A car of mass 1000 kg moving on a horizontal road with a steady speed of 10 m/sec has total frictional force on it of 400 N. The power due to engine is

A. 40 W
B. 400 W
C. 4000 W
D. 20 W

Q. 43 Water is pouring down from a waterfall at the rate of 75kgs⁻¹ on the blades of a turbine. If the height of the 'fall' be 100 m, then the power delivered to the turbine is nearly.

A. 95kW
B. 75kW
C. 100kW
D. 0 kW

Q. 44 In case of work done by variable force we obtain an exact result for work done from equation $W_{total} = \sum_{i=1}^{n} F_i \cos\theta_i \Delta d_i$, if

A. $F \to 0$
B. $\Delta d \to 0$
C. $\theta \to 0$
D. All of these

Q. 45 A force F acting on an object varies with distance X as shown in fig.
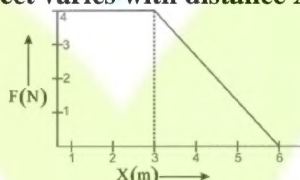
Calculate the work done by the force

A. 18 J
B. 12 J
C. 15 J
D. 9 J

Q. 46 In which given case more work is done

A. To lift body of 40 g through 50 cm
B. To compress a spring of spring constant 10 Nm⁻¹ through 2 cm
C. To move body of 20 g with force 2 N for 3 cm
D. To brought two electron closer to 10 cm

Q. 47 The force displacement graph is shown, from graph work done is
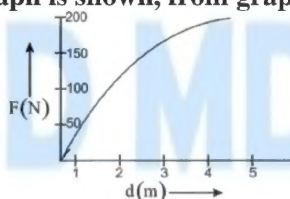
A. 500 J
B. More than 500 J
C. Less than 500 J
D. 50 J

Q. 48 A body is thrown vertically upward which of following statement is correct

A. P.E of body increases uniformly during time ascent
B. Total energy of body remains constant throughout the motion of body
C. K.E of body decreases uniformly during time ascent
D. All are correct

Q. 49 A machine needed 1000J of energy to raise a 10 kg block at a distance of 6.0m. what is the machine efficiency?

A. 50%
B. 80%
C. 70%
D. 59%

Q. 50 If a machine moves a load W through a distance h then the useful work done by the machine is

A. Input
B. Efficiency
C. Output
D. Mechanical advantage

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1. D	16. C	31. B	46 - A
2. C	17. C	32. C	47 - B
3. D	18. D	33. A	48 - D
4. C	19. D	34. D	49. D
5. C	20. B	35. C	50 - C
6. D	21. A	36. C	
7. A	22. C	37. D	
8. B	23. B	38. C	
9. A	24. A	39. B	
10. B	25. D	40. D	
11. C	26 - D	41. C	
12. D	27. D	42. C	
13. C	28 - A	43. B	
14. A	29 - D	44. B	
15. B	30 - B	45. A	